

REMARKS

Reconsideration of the present application is respectfully requested.

Summary of Office Action

Claims 1-12, 33, 35-42 and 50-54 stand subject to a restriction requirement.

Claims 2, 7 and 9 stand objected to as failing further limit the subject matter of a previous claim.

Claim 50 stands rejected under 35 U.S.C. § 101.

Claims 1-12, 33, 35-42 and 50 stand rejected under 35 U.S.C. § 103(a) based on Hasebe 6,212,570 and further in view of Ji et al. 2002/0172203.

Summary of Amendments

Claims 13-32, 34 and 43-49 were previously canceled. In this amendment, claims 2, 7 and 9 have been canceled, and claims 1, 8, 33, 50, 51 and 54 have been amended. No new matter has been added.

Response to Restriction Requirement

Applicants hereby elect the Group I claims (1-12, 33, 35-42 and 50) with traverse.

Applicants respectfully submit that the restriction requirement is in error and should not have been made. The Office has mistakenly concluded that the pending claims are drawn to more than one invention. Furthermore, the Office has associated at least the Group I and II claims with the wrong search classes/subclasses.

The present invention generally relates to proximity-based lossless compression of client information in a network device such as a routing server or agent. The Office classifies the Group I claims in class 709, subclass 203. Class 709, subclass 203 is defined as "client/server" with "subject matter wherein at least one local computer provides a user interface and performs local data processing to interact with at least one remote computer which implements data processing (e.g., data management, data sharing) within a generic time-sharing environment in response to the local computer to transfer data between the local computer and the remote computer"

<http://www.uspto.gov/go/classification/uspc707/sched707.htm#C707S203000>

(emphasis added). However, none of Applicants' claims recite any user interface. Therefore, the Office was in error to classify the Group I claims in class 709, subclass 203.

The Office classifies the Group II claims (51, 52 and 54) in class 709, subclass 224. Class 709, subclass 224 is defined as "computer network monitoring", and specifically, "subject matter further comprising means or steps for detecting or observing operating characteristics or conditions of computers connected through a computer network or of the network itself" (emphasis added). None of Applicants' claims relate to detecting or observing operating characteristics or conditions of computers. The closest the claims come to that is to recite proximity measurements for clients. However, proximity measurements for clients are not operating characteristics or conditions of the clients (per class 709/224); they relate to network latency between devices on

the network (see specification, para. [0005]). Therefore, the Office was in error to classify the Group II claims in class 709, subclass 224.

The Office classifies the group III claim (claim 53) in class 707, subclass 101, defined as "manipulating data structure", and specifically, "data structure conversion, compression, compaction, and compilation, for optimization of database and file storing, and for data compatibility between different or multiple databases." Assuming *arguendo* this classification is correct for claim 53, then all of the pending claims should be classified in this class/subclass.

The Office appears to have made the mistake of concluding there are multiple inventions merely because the independent claims are not all of the same scope. But in fact, all of the claims relate to a single invention, which generally relates to proximity-based lossless compression of client information in a network device such as a routing server or agent. (As previously noted, the present invention has an aspect that relates to a server on a content distribution network, and another aspect that relates to an agent on the content distribution network. These two aspects are complementary, i.e., the agents and server cooperate with each other to perform the overall technique disclosed in Applicants' specification.)

Hence, Applicants respectfully submit that the present restriction requirement is not proper and that all of the pending claims should have been examined after Applicants' response to the last Office Action. Applicants therefore respectfully request that the restriction requirement be withdrawn and that all pending claims be considered in view of the remarks below.

Objection to Claims

Claims 2, 7 and 9 have been canceled. The objection to those claims is therefore moot.

Section 101 Rejection

Claim 50 remains rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicants respectfully maintain that the rejection is in error. The Office asserts that the claim elements "means for acquiring," "means for dynamically compressing," etc. are software per se. That assertion is incorrect. The elements of claim 50 recite functions. As anyone of ordinary skill in the art understands, software cannot perform any function without hardware. Only when some form of processor executes the software can a function be performed. Consequently, the Office cannot rightly interpret claim 50 as covering pure software (software per se).

Also, the courts have made clear that in a means-plus-function claim in which the disclosed structure is a computer or microprocessor programmed to carry out an algorithm, the structure in the claim is interpreted to be a computer programmed to perform the disclosed algorithm, not the algorithm itself or software per se. See *WMS Gaming Inc. v. Int'l. Game Technology*, 184 F.3d 1339, 1349 (Fed. Cir. 1999)(emphasis added). Therefore, the rejection of claim 50 is contrary to established case law.

For these reasons, Applicants respectfully submit that the rejection is improper as to claim 50 and should be withdrawn.

Section 103 Rejection

Claims 1, 33, 50, 51 and 53

Claim 1 recites:

1. (Currently amended) A method comprising:
storing in a data structure information representing a plurality of clients on a network, the data structure including network addresses of the clients **and network proximity measurements representing measured proximities between the clients and a plurality of content delivery agents;**
dynamically and losslessly compressing the data structure **based on the network addresses and the network proximity measurements in the data structure;** and
transmitting the data structure to a remote server **configured to use the data structure to redirect content requests** from the clients. (Emphasis added.)

No combination of Hasebe and/or Ji discloses or suggests such a method or renders it obvious.

The Office contends that Hasebe discloses all of the limitations of claim 1 except dynamically and losslessly compressing the data structure based on the network addresses and the network proximity measurements in the data structure. The Office admits that Hasebe does not disclose this functionality but contends that Ji discloses it (Office Action, pp. 7-8).

The rejection is moot in view of the amendment to claim 1. Nonetheless, Applicants respectfully submit that the Office is mistaken both in its statement of what Hasebe discloses and its statement of what Ji discloses. As such, no combination of Hasebe and/or Ji discloses or suggests all of the limitations of Applicants' independent claims.

Although Applicants arguments here are directed to the cited combination of references, it is necessary to consider their individual disclosures, in order to ascertain what combination, if any, could be made from them.

The Office relies on Ji as disclosing dynamically and losslessly compressing the data structure based on the network addresses and the network proximity measurements in the data structure. The Office cites Ji at para. [0015] & [0028]. However, Ji not disclose or even suggest using or acquiring network proximity measurements. Further, Ji does not disclose or suggest using or acquiring network proximity measurements representing measured proximities between the clients and a plurality of content delivery agents, which is recited in amended claim 1, or using network proximity measurements for clients as a basis for compressing a data structure of client information, including network addresses and the network proximity measurements.

Ji discloses storing IP subnet information in a two-level table. However, IP subnet addresses are not proximity measurements or any suggestion thereof. Ji further discloses that the second-level table, called T2_RIB, can be compressed by using bitmaps that correspond to next hop prefix length (NHPL) information ([0015], [0028], [0040], [0043], [0044]). However, this also is not any suggestion of proximity measurements representing measured proximities between the clients and a plurality of content delivery agents, or compressing a routing table based on such proximity measurements. The lack of any disclosure in Ji of proximity measurements should not be surprising, since Ji is not concerned at all with efficiency of content distribution, as is the system to which the present invention pertains.

Thus, Ji does not disclose or suggest the functionality for which the Office relies on Ji. For at least this reason, therefore, the rejection of claim 1 based on Hasebe/Ji is improper and should be withdrawn.

Regarding Hasebe, the Office's characterization of what Hasebe discloses is inaccurate in at least two respects. First, the Office contends that Hasebe discloses proximity measurements for the clients, citing Hasebe at col. 8, lines 31-45, and col. 10, lines 15-25 (Office Action, p. 7). The closest Hasebe comes to that is the disclosure in col. 10, lines 15-18 that the routing information transmitted between devices 40A, 40B, 40C includes "transmission delay". However, assuming *arguendo* that transmission delay corresponds to network proximity measurements, this disclosure in Hasebe does not indicate that the transmission delay relates to clients (e.g., user terminal devices 10A, 10B, 10C), and certainly not measured proximities between the clients and a plurality of content delivery agents as per amended claim 1. Hasebe is silent regarding the particular devices or hops to which that delay relates. In the absence of further information, the Office cannot rightly assume it relates to clients. Note that "[i]nherency . . . may not be established by mere probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1269 (Fed. Cir. 1991) (quoting In re Oelrich, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981) (emphasis added)).

Second, the Office contends that Hasebe discloses transmitting, to a remote server, a data structure which includes information representing clients, including network addresses of the clients and network proximity measurements

for the clients, where the remote server is configured to use the data structure to redirect content requests from a plurality of clients (Office Action, p. 7). The Office cites Hasebe at col. 8, lines 12-45, col. 9, lines 64-67 and col. 10, lines 15-25. Hasebe does disclose that devices 40A, 40B, 40C transmit "routing information" (col. 10, lines 15-18). However, Hasebe does not disclose or suggest that such routing information includes information representing clients, per claim 1.

Thus, Hasebe does not disclose or suggest the functionality for which the Office relies on Hasebe. For the above reasons, therefore, no combination of Hasebe and/or Ji discloses or suggests all of the limitations of Applicants' independent claims, and thus, no combination of these references could render the invention of claim 1 obvious.

Independent claims 33, 50, 51 and 53 include limitations similar to those discussed above regarding claim 1 (and other limitations) and, therefore, are also thought to be patentable over the cited art along with their dependent claims.

Claim 51

The Office has not yet addressed the patentability of claim 51. Claim 51 recites limitations similar to those discussed above regarding claim 1 and, therefore, is thought to be patentable over the cited art along with its dependent claims at least for reasons similar to those stated above.

In addition, claim 51 also recites:

detecting when **proximity measurements** for at least two clients which share a network address prefix **are within a predetermined time range of each other**, and
in response to detecting the proximity measurements being within the predetermined range of each other for the at least two clients, **merging entries for the at least two clients in the data structure . . .** (Emphasis added.)

Hasebe/Ji also does not disclose or suggest detecting when proximity measurements for at least two clients which share a network address prefix are within a predetermined time range of each other, nor merging entries in a data structure in response to such detection.

The Office relies on Ji as disclosing these features, citing Ji at para. [0015], [0029], [0032] and [0049] (Office Action, p. 9, rejection of claim 3). Ji discloses that a table can be compressed by using bitmaps that correspond to next hop prefix length (NHPL) information ([0015], [0028], [0040], [0043], [0044]). However, Applicants find no hint of time-based proximity measurements there or anywhere else in Ji. Ji does not disclose or suggest proximity measurements, much less proximity measurements for clients, or time-based proximity measurements, or merging entries for two or more clients based on such proximity measurements.

Hasebe mentions that routing information can include "transmission delays", as noted above, but does not disclose that such delay information relates to clients or measured proximities between the clients and a plurality of content delivery agents, and does not disclose merging entries for two or more clients in a data structure based on such proximity measurements.

Therefore, claimed 51 and all claims which depend on it are thought to be further patentable over the cited art for this additional reason.

Claim 53

The Office has not yet addressed the patentability of claim 53. Claim 53 includes limitations similar to those in claims 1 and 51 discussed above, as well as additional limitations. Therefore, claim 53 is thought to be patentable over the cited art for at least similar reasons to those discussed above regarding claims 1 and 53.

In addition, claim 53 recites:

- storing in the entry for each client a network address of the client, each network address including a network address prefix;
- generating a bitmap mask for each client** based on the network address of each client;
- storing the bitmap mask **for each client** in the corresponding entry in the first data structure;
- repeatedly measuring a proximity between the agent and each of the plurality of clients;**
- storing the measured **proximity for each client** in the corresponding entry in the first data structure;
- detecting when the measured proximities are within a predetermined range of each other for at least two clients which have the same network address prefix;**
- in response to the measured proximities being within the predetermined range of each other** for the at least two clients, **merging the entries** for the at least two clients in the first data structure, **including**
 - using the network address of one of the entries being merged to represent both of the entries being merged, and**
 - generating a single bitmap mask to represent the entries being merged as a logic OR of the individual bitmap masks of the entries being merged; and**
 - for each of the entries in the first data structure, reporting the corresponding network address and bitmap mask to a request routing server. (Emphasis added.)

Hasebe/Ji does not disclose or suggest these additional operations, particularly (though not necessarily limited to) the limitations emphasized above

in bold type. Therefore, claimed 53 is thought to be further patentable over the cited art for this additional reason.

Claim 54

The Office has not yet addressed the patentability of claim 54. Claim 54 relates to the server aspect of the present invention. It recites:

54. (Currently amended) A method comprising:
receiving at a server, from a remote network agent, information relating to a plurality of clients on a network, the information including a plurality of network addresses **and a corresponding plurality of masks, each of the network addresses representing one or more of the clients, at least one of the masks being indicative of compression of the corresponding received information for a corresponding two or more of the plurality of clients, said compression having been performed by the remote network agent based on network proximity measurements representing measured proximities between the plurality of clients and a plurality of content delivery agents;**
storing the received information relating to the plurality of clients in a data structure; and
using the data structure at the server to redirect content requests from the clients. (Emphasis added.)

Hasebe/Ji does not disclose or suggest redirecting content requests from clients based on a data structure created from information received from a remote network agent, where that received information includes a plurality of network addresses and a corresponding plurality of masks, each of the network addresses representing one or more of the clients, at least one of the masks being indicative of compression of the corresponding received information for a corresponding two or more of the plurality of clients, said compression having been performed by the remote network agent based on network proximity

measurements representing measured proximities between the plurality of clients and a plurality of content delivery agents

For example, Hasebe/Ji does not disclose or suggest generating a bitmap mask for each client. Further, Hasebe/Ji does not disclose or suggest at least one of the masks being indicative of compression of the corresponding received information for a corresponding two or more of the plurality of clients. Hasebe/Ji further does not disclose or suggest the use of network proximity measurements representing measured proximities between the plurality of clients and a plurality of content delivery agents.

The Office relies on Ji as disclosing modifying the masks to indicate entries in the data structure that have been compressed, citing Ji at para. [0028] (Office Action, p. 16, rejection of claim 36). Ji discloses using bitmaps to compress table entries based on next hop prefix length (NHPL) information, but the bitmaps in Ji do not correspond to clients, and the NHPL information does not correspond to proximity measurements for clients, or measured proximities between the plurality of clients and a plurality of content delivery agents.

Hasebe mentions that routing information can include "transmission delays", as noted above, but does not disclose that such delay information relates to clients or measured proximities between the clients and a plurality of content delivery agents, and does not disclose compression of information for two or more clients based on such proximity measurements.

Therefore, claim 54 is thought to be patentable over the cited art.

Applicants have not necessarily discussed here every reason why every pending independent claim is patentable over the cited art; nonetheless, Applicants are not waiving any argument regarding any such reason or reasons. Applicants reserve the right to raise any such additional argument(s) during the future prosecution of this application, if Applicants deem it necessary or appropriate to do so.

Dependent Claims

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary. Therefore, Applicants' silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.


Conclusion

For the foregoing reasons, the present application is believed to be in condition for allowance, and such action is earnestly requested.

If there are any additional charges, please charge Deposit Account No. 50-2207.

Respectfully submitted,
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